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EXAMINER	
TABATABAI, ABOLFAZL	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/936,816	WERNER ET AL.	
	Examiner	Art Unit	
	Abolfazl Tabatabai	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-78,80 and 81* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45,47-78,80 and 81* is/are rejected.

7)☒ Claim(s) *46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on *01 April 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/13/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Objections

1. Claims 73-73 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim (s). See MPEP § 608.01(n). Accordingly, the claims 73-75 have not been further treated on the merits.

Response to Amendment/Arguments

2. Applicant's arguments, (pages 18-21), filed on June 21, 2005 with respect to the rejection(s)of claim(s) 1-3, 20, 62, 63 and 70-72 under Vynne et al (U S 5,960,081) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Nakamura et al (U S 6,185,312 B1) and Levine et al (U S 6,209,094 B1).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-5, 9-15, 19, 21, 22, 45, 47, 49, 50 and 60-63 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al (U S 6,185,312 B1).

Regarding claim 1, Nakamura discloses a method of embedding a watermark signal comprising a series of watermark values in a picture signal comprising a series of picture sample values (column 19, lines 42-50), the method comprising adjusting picture sample values based on watermark values (column 20, lines 38-52), characterized in that adjusting comprises, for each watermark value (column 19, lines 42-50);

combining the watermark value with a respective subset of the picture sample values using a plurality of adjustment factors (fig. 9 element 216 and column 19 lines 42-50), each adjustment factor being based on a local estimate of the visibility of the watermark at a corresponding picture sample location (column 5, lines 63-67; column 6, lines 1-3 and column 20, lines 50-52).

Regarding claim 2, Nakamura discloses a method according to Claim 1 wherein the magnitude of each adjustment factor is a function of the picture sample values (column 15, lines 11-22), preferably based on the Localized variance of the picture sample values (column 51, lines 59-61).

Regarding claim 3, Nakamura discloses a method according to Claim 1 or Claim 2, wherein the sign of each adjustment factor is a function of the watermark values (column 19, lines 42-50).

Regarding claim 4, Nakamura discloses a method according to Claim 1, wherein combining comprises adding an adjustment factor to each picture sample value (column 18, lines 15-18).

Regarding claim 5, Nakamura discloses a method according to Claim 1,wherein the picture sample locations for each said subset corresponding to a

given watermark value are substantially adjacent (column 11, lines 16-24).

Regarding claim 9, Nakamura discloses a method according to Claim I, wherein watermark values are assigned to substantially all of said regions of the picture 9column 45, lines 25-49).

Regarding claim 10, Nakamura discloses a method according to Claim I, wherein watermark values are assigned to a first group of said regions and sample values of a data sequence are assigned to a second group of said regions (column 7, lines 65-67).

Regarding claim 11, Nakamura discloses a method according to Claim 4, wherein the picture sample locations for each subset are scattered throughout the picture (column 11, lines 59-61).

Regarding claim 12, Nakamura discloses a method according to Claim 1, wherein the watermark signal comprises a pseudo-random sequence (column 2, lines 51-55).

Regarding claim 13, Nakamura discloses a method according to Claim 1, wherein the watermark signal comprises a regular pattern (column 18, lines 15-22).

Regarding claim 14, Nakamura discloses a method according to Claim 1, wherein the watermark signal has a substantially zero mean whereby the global mean of the picture sample values in the picture is substantially unaffected by embedding of the watermark (see abstract).

Regarding claim 15, Nakamura discloses a method according to Claim I,

wherein combining is arranged to change the local mean of the picture sample values included in each said subset, the sign of the change being determined by the corresponding watermark value (fig.17 element 2148).

Regarding claim 19,Nakamura discloses a method according to Claim 1, for embedding a watermark in a sequence of pictures corresponding to a motion video sequence, wherein the subsets to which watermark values are applied vary from picture to picture (column 5, lines 48-55).

Regarding claim 21, Nakamura discloses a method according to Claim 1, for embedding a watermark in a sequence of pictures corresponding to a motion video sequence, wherein applying the watermark to the sequence of pictures includes compensating for motion between pictures (column 7, lines 26-29).
In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises a grid dividing the picture into a plurality of regions is defined and wherein each said subset comprises picture samples corresponding to a respective region of the grid (column 3, lines 26-51).
It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a grid dividing as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Claim 22 is similarly analyzed as claim 21 above.

Claim 45 is similarly analyzed as claim 1 above.

Regarding claim 47, Nakamura discloses a method according to Claim 45, wherein said number of substantially independent watermarks comprises a subset selected from a defined set of substantially independent watermarks (see abstract).

Claim 49 is similarly analyzed as claim 47 above.

Regarding claim 50, Nakamura discloses a method according to Claim 45, wherein the subset is selected or said substantially independent watermarks are selected in independence on information to be encoded in the picture (column 7, lines 26-29).

Regarding claim 48, Nakamura discloses a method according to Claim 45, wherein the subset is selected or said substantially independent watermarks are selected independence on information to be encoded in the picture (column 7, lines 26-49).

Regarding claim 60, Nakamura discloses a watermarked picture, a sequence of pictures, a signal or data storage means containing a picture having a watermark embedded therein by a method according to Claim 1(fig. 6 element 117).

Regarding claim 61, Nakamura discloses an apparatus or a computer program product arranged to perform a method according to Claim 1 (column 52, lines 37-45).

Regarding claim 62, Nakamura discloses a method of decoding data in a

picture signal comprising determining local mean values of picture samples corresponding to regions of the picture in which data is carried (column 19, lines 42-50); comparing said local mean values to estimated or reference local mean values for said regions in the absence of the data (column 18, lines 15-18), and determining a data value from the result of each comparison, wherein preferably the data value is determined from at least the sign of the difference between the determined local mean value and the estimated or reference local mean value (Column 5, lines 63-67; column 6, lines 1-3; column 14, lines 42-51 and column 20, lines 54-67).

Regarding claim 63, Nakamura discloses a method of embedding data comprising a series of data values in a picture comprising a series of picture values characterized by defining a plurality of subsets of the picture values (column 19, lines 42-50), one subset for each data value and adding an adjustment factor to each picture value in each subset (column 18, lines 15-18), a first component (column 25, lines 23-29), preferably the magnitude (column 8, line 52), of each adjustment factor being a function of an estimate of the visibility of embedded data at the picture value location and being variable between the picture values of each subset 9column 31, lines 49-54), a second component, preferably the sign, of the adjustment factor being determined by the data value and being substantially constant for the picture values of each subset (column 5, lines 63-67; column 6, lines 1-3; column 14, lines 42-51 and column 20, lines 54-67).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 6-8, 16-18, 23-44, 48, 51-59, 64-69, 80 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al (U S 6,185,312 B1) in view of Levine et al (U S 6,209,094 B1).

Regarding claim 6, Nakamura is silent about the specific details regarding a method according to Claim 5, wherein a grid dividing the picture into a plurality of regions is defined and wherein each said subset comprises picture samples corresponding to a respective region of the grid.

In the same field of endeavor, (watermarking), however, Levine discloses robust

watermarking method and apparatus for digital signals comprises a grid dividing the picture into a plurality of regions is defined and wherein each said subset comprises picture samples corresponding to a respective region of the grid (column 3, lines 26-51).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a grid dividing as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 7, Nakamura discloses a method according to Claim 6, wherein the grid is substantially rectangular (column 34, lines 1-9).

Regarding claim 8, Nakamura discloses a method according to Claim 7, wherein each region corresponds to a block of a coding process, for example MPEG or JPEG compression (column 7, lines 33-37).

Regarding claim 16, Nakamura is silent about the specific details regarding a method according to Claim 1, wherein each subset contains at least 16 picture sample values.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises subset contains at least 16 picture sample values (column 11, lines 27-29).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use 16 picture sample values as taught by Levine in the

system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 17, Nakamura is silent about the specific details regarding a method according to Claim I, wherein the adjustment factors are a function of a global modulation index variable whereby the energy of the watermark can be controlled.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises the adjustment factors are a function of a global modulation index variable whereby the energy of the watermark can be controlled (fig. 20 element 2000).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use modulation index variable as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 18, Nakamura is silent about the specific details regarding a method according to Claim 1,wherein said adjustment factors are assigned a value substantially equal to zero for regions having a measure of variance below a predetermined threshold.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises adjustment factors are assigned a value substantially equal to zero for regions having a measure of variance below a predetermined threshold (column 7, lines 30-38).
It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use predetermined threshold as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 20, Nakamura discloses a method of embedding a watermark within a sequence of pictures corresponding lo a motion video sequence wherein the watermark is combined with picture sample values characterized in that the method of combining varies from picture lo picture (column 5, lines 63-67 and column 6, lines 1-3) to reduce the appearance of static artifacts in the sequence.
However, Nakamura is silent about the specific details regarding reducing the appearance of static artifacts in the sequence
In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises reducing the appearance of static artifacts in the sequence (column 3, lines 14-18).
It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use reduce the appearance of static artifacts in the

sequence as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 23, Levine discloses a method according to Claim 22, wherein applying the watermark includes determining at least a local measure of accuracy of the estimate of average motion (column 7, lines 30-38).

Claims 24-26 are similarly analyzed as claim 20 above.

Regarding claim 27, Nakamura discloses a method according to Claim 26, wherein a measure of the accuracy of said estimate is determined and the strength of the watermark is varied as a function of said measure (column 32, lines 49-54).

Regarding claim 28, Nakamura discloses a method according to Claim 20, wherein the watermark is embedded in some but not all pictures of the sequence, preferably wherein at most one in two pictures are watermarked (column 5, lines 63-67).

Claim 29 is similarly analyzed as claim 20 above.

Regarding claim 30, Nakamura is silent about the specific details regarding a method according to Claim 29, wherein embedding the watermark includes defining a grid dividing the picture into regions and wherein at least one characteristic of the grid, for example shape, size or alignment, is varied between pictures of the sequence.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises embedding the watermark includes defining a grid dividing the picture into regions and wherein at least one characteristic of the grid, for example shape, size or alignment, is varied between pictures of the sequence (column 10, lines 33-49 and fig. 20A element 2000).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a grid dividing and an alignment as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 31, Nakamura is silent about the specific details regarding a method according to Claim 1,further comprising communicating or storing the watermarked picture together with information to assist in identifying the watermark.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises communicating or storing the watermarked picture together with information to assist in identifying the watermark (column 21, lines 19-25).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use communicating or storing the watermarked picture as taught by Levine in the system of Nakamura because Levine provides Nakamura

an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 32, Nakamura discloses a method according to Claim 31, wherein said information comprises a series of local mean values, each mean value corresponding to the local mean of a subset of picture sample values prior to application of a watermark value (column 14 lines 44-51).

Regarding claim 33, Nakamura discloses a method according to Claim 32, wherein the information is compressed, preferably JPEG compressed (column 1, lines 24-32).

Regarding claim 34, Nakamura discloses a method of testing for the presence of a watermark embedded in a picture signal by a method according to Claim 1,comprising receiving the picture signal (column 7, lines 59-67);
However, Nakamura is silent about the specific details regarding the steps of:

correlating the picture signal or a processed signal derived therefrom with a watermark signal;

outputting an estimate of the presence of the watermark based on the results of said correlation.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprising the steps of:

correlating the picture signal or a processed signal derived therefrom with a watermark signal (column 20, lines 15-28 and 29-48);

outputting an estimate of the presence of the watermark based on the results of said correlation (fig.22, element 2220).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use correlating the picture as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 35, Nakamura is silent about the specific details regarding a method according to Claim 34, including processing the picture signal prior to said correlating to produce said processed signal having an enhanced watermark content.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises processing the picture signal prior to said correlating to produce said processed signal having an enhanced watermark content (fig. 12, element 1204).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an enhanced watermark as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 36, Nakamura is silent about the specific details

regarding a method according to Claim 35, wherein processing includes filtering based on received reference picture information.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises processing includes filtering based on received reference picture information (see abstract). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use filtering as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 37, Nakamura discloses a method according to Claim 36, wherein the received reference picture information comprises reference local mean values indicative of local mean values of subsets of picture samples in the picture prior to watermarking, or compressed information from which said reference local mean values can be derived (column 13, lines 62-65 and column 14, lines 44-51).

Regarding claim 38, Nakamura discloses a method according to Claim 37, wherein processing includes estimating local mean values indicative of local mean values of subsets of picture samples in the picture prior to watermarking (column 14, lines 44-51).

Regarding claim 39, Nakamura discloses a method according to Claim 37,

wherein processing includes subtracting the reference or estimated local mean values from local mean values determined for the received picture signal to give a difference signal (column 35 lines 66-67 and column 36, lines 1-2).

Regarding claim 40, Nakamura discloses a method according to Claim 37, wherein a grid is defined dividing the received signal into regions corresponding to allocation of watermark values, wherein local mean values are determined for each of said regions (column 14, lines 44-51).

Regarding claim 41, Levine discloses a method according to Claim 34, further comprising deriving a series of data values from the received picture signal (column 19, lines 9-14).

Regarding claim 42, Nakamura discloses a method according to Claim 39, wherein the data sample values are determined based on the sign of the difference signal in regions corresponding to allocation of data values (column 19, lines 42-50).

Regarding claim 43, Levine discloses a method according to Claim 34, wherein said correlating is performed for a plurality of offsets and the offset giving the maximum correlation is determined to give a measure of the position of the watermark within the picture (column 25, lines 10-23).

Regarding claim 44, Levine discloses a method according to Claim 34, wherein correlating is performed taking into account possible effects of picture processing operations, for example rotation, scaling, shifting, cropping or re-sampling operations.

Regarding claim 48, Levine discloses a method according to Claim 47, wherein said number is three (column 18, lines 57-67).

Regarding claim 51, Levine discloses a method according to Claim 45, wherein three bipolar watermarks are combined to produce a single bipolar watermark with the property that the product of the combined watermark with each of the constituent marks has an expectation value of ½ (column 3, lines 52-58 and column 6, lines 25-33).

Claim 52 is similarly analyzed as claim 47 above.

Regarding claim 53, Nakamura is silent about the specific details regarding a method according to Claim 52, wherein said number of substantially independent watermarks comprises a subset selected from a defined set of substantially independent watermarks wherein the picture is cross correlated with a composite watermark derived from a sum of each of the watermarks of said defined set.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises number of substantially independent watermarks comprises a subset selected from a defined set of substantially independent watermarks wherein the picture is cross correlated with a composite watermark derived from a sum of each of the watermarks of said defined set (column 30, lines 48-53).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use composite watermark as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system

which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 54, Levine discloses a method according to Claim 53, wherein, at least in the event of cross correlation with said composite watermark yielding a positive result, the picture is cross correlated with each of the watermarks of said defined set (column 30, lines 48-53).

Claims 55 and 58 are similarly analyzed as claim 53 above.

Regarding claim 56, Levine discloses a method according to Claim 34, including estimating the cumulative average motion in a sequence of pictures (column 20, lines 42-45).

Regarding claim 57, Nakamura discloses a method according to Claim 34,further comprising computing a motion-compensated average picture taking into account the average motion in the pictures (column 14, lines 5-10).

Regarding claim 59, Nakamura discloses a method of detecting a motion-compensated watermark comprising:

computing an average picture taking into account the average motion in the pictures (fig. 3 element 23);

However, Nakamura is silent about the specific details regarding the steps of:

estimating the cumulative average motion in a sequence of pictures;

calculating the cross-correlation function of the motion-compensated average picture and the watermark.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprising the steps of:

estimating the cumulative average motion in a sequence of pictures (column 20, lines 42-45);

calculating the cross-correlation function of the motion-compensated average picture and the watermark (column 20, lines 15-19 and column 25, lines 10-16).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use estimating the cumulative average motion and calculating the cross-correlation function as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 64 Nakamura discloses a method of embedding a watermark signal comprising a series of watermark values in a picture signal comprising a series of picture sample values the method comprising adjusting picture sample values based on watermark values (column 19, lines 42-50) including generating the watermark by convolving a key with a repeated data sequence to produce a data carrying watermark.

However, Nakamura is silent about the specific details regarding generating the watermark by convolving a key with a repeated data sequence to produce a data carrying watermark.

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprises generating the watermark by convolving a key (fig. 12 element 1208).
It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use convolving a key as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Claims 65 and 66 are similarly analyzed as claim 64 above.

Regarding claim 67, Levine discloses a method according to claim 66, wherein a different key segment is convolved with each data bit (fig. 2 element 214 and fig. 20 element 2014).

Regarding claim 68, Levine discloses a method according to Claim 66, wherein each bit of the watermark is applied to a plurality of bits of the picture, preferably a block of at least 4 bits of the picture (column 17, line 58-63).

Regarding claim 69, Levine discloses a method according to Claim 64, wherein a registration watermark is applied to the picture in addition to the data carrying watermark, to facilitate decoding of data (column 17, lines 12-15 and 44-53).

Regarding claim 80, Nakamura discloses a method of embedding data in a picture comprising:

applying the watermark to the picture by combining each watermark value with a plurality of picture values based on a local estimate of the visibility of the watermark (column 5, lines 63-67; column 6, lines 1-3 and column 20, lines 50-52).

However, Nakamura is silent about the specific details regarding the step of:

generating a data-carrying watermark having a plurality of watermark values by convolving a set of data comprising a plurality of bits of data with a key comprising a plurality of bits .

In the same field of endeavor, (watermarking), however, Levine discloses robust watermarking method and apparatus for digital signals comprising the step of:

generating a data-carrying watermark having a plurality of watermark values by convolving a set of data comprising a plurality of bits of data with a key comprising a plurality of bits (column 4, lines 51-57 and column 17, lines 1-15).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use convolving a key as taught by Levine in the system of Nakamura because Levine provides Nakamura an improved system which watermark signal is encoded in a basis signal by division of the basis signal into segments and inverting the basis in segments corresponding to watermark data bits with a first logical value.

Regarding claim 81, Levine discloses a method according lo Claim 80 for sequence of pictures wherein sets of data are embedding a data stream in a generated at intervals from the data Stream and each set is embedded in a

plurality of pictures (column 11, lines 33-54).

7. Claims 70-78 are rejected under 35 U.S.C. 102(e) as being anticipated by Levine et al (U S 6,209,094 B1).

Regarding claim 70, Levine discloses a method of embedding a watermark in a moving picture comprising changing the watermark or moving the watermark, preferably substantially randomly, at a shot change, or following detection of an accumulated change in picture content above a predetermined threshold (column 24, lines 40-48).

Claims 71 and 72 are similarly analyzed as claim 70 above.

Regarding claim 73, Levine discloses a method of labeling a frame of a moving picture signal comprising embedding an identifier of at least 64bits into the picture, preferably by a method according to any preceding method claim (column 23, lines 33-37).

Regarding claim 74, Levine discloses a method according to Claim 73, for use in labeling a broadcast signal or signal to be distributed wherein the identifier encodes at least one of the originator of the material, an authorized recipient and a material identifier 9column 23, lines 58-63).

Regarding claim 75, Levine discloses a method according to Claim 73, for use in Labeling a source material in a studio, preferably implemented in a camera

or recording device, wherein the identifier includes at least one of:- an identifier of the source of the material, preferably including at least one of an identifier of a camera, recording time, location, conditions, and a user-definable label (column

25, lines 10-23).

Claims 76 and 77 and similarly analyzed as claim 64 above.

Regarding claim 78, Levine discloses a method of detecting a watermark in a sequence of moving pictures comprising determining an expected position of the watermark and thereafter detecting the watermark based on the expected position, wherein the expected position is re-determined following a shot change or a change in picture content above a threshold (column 3, lines 52-58 and column 24, lines 40-48).

Allowable Subject Matter

8. Claim 46 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Rhoads (U S 5,850,481) discloses steganographic system.

Nakamura et al (U S 6,185,312 B1) disclose method for embedding and reading

watermark-information in digital form, and apparatus thereof.

Bhasharan et al (U S 6,064,764) disclose fragile watermarks for detecting tempering in images.

Cox et al (U S 6,154,571) disclose robust digital watermarking.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (571) 272-7458.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mehta Bhavesh M, can be reached at (571) 272-7453. The fax phone number for organization where this application or proceeding is assigned is (571) 273-8300.

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September 15, 2005

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